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PARASITES OF WESTERN AUSTRALIA
IX
MYOBIIDAE PARASITIC ON RODENTS (ACARINA: PROSTIGMATA)

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and

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ABSTRACT

Six new species of Myobiidae parasitic on Australian rodents are described and figured. A key to subgenus *Syconycterobia,* typical for native rodents from Australia is given.

INTRODUCTION

In two previous papers we have studied the Myobiidae parasitising the Bats and the Marsupials in Australia (Fain and Lukoschus, 1979).

This paper is devoted to the study of this group of mites from Australian Rodents, mainly the species found in Western Australia.

The first record of myobiids from Rodents is that of Domrow (1955) who found *Radfordia ensifera* (Poppe) on *Rattus rattus* and *R. norvegicus* in Brisbane.

The cosmopolitan parasites of the Mouse *Mus musculus,* e.g. *Myobia musculi* (Schrank) and *Radfordia affinis* (Poppe), were reported by Domrow (1962) from Innisfail, North Queensland.

In 1963, Domrow described two new species of *Radfordia: R. fanningi* from *Melomys lutillus* in North Queensland, and *R. hornerae,* from *Rattus assimilis* in N.S.W.

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Fain (1973), erected a new subgenus *Syconycterobia,* in the genus *Radfordia* for a single specimen of a new species collected on a Bat in New Guinea. In 1974, this author transferred *Radfordia fanningi* Domrow into the subgenus *Syconycterobia.* In 1976, he described a new species belonging to that subgenus *(Radfordia (Syconcyterobia) pseudomys),* from a rat, *Pseudomys hermansburgensis,* Ehrenberg Range, Central Australia.

In the present paper, we describe 5 new species of the subgenus *Syconycterobia,* from 3 different genera of Rats. These new findings show that in Australia this subgenus is almost entirely confined to the native genera of Rodents e.g. *Conilurus, Pseudomys, Zyzomys, Mastacomys, Notomys* and *Melomys.* Amongst these genera only one, *Melomys,* is also represented in New Guinea and in other regions of Australasia.

It seems very probable that the typical host of the subgenus *Syconycterobia* (a Bat *Syconycteris crassa papua,* from New Guinea) was accidental and that the true host was more likely a Rat.

If we include the 5 new species described here, the total number of Myobiidae known from Australian Rodents is at present 11; they belong to 2 genera, *Radfordia* and *Myobia.*

The types of the new species have been deposited in the Western Australian Museum. Paratypes in Field Museum of Natural History, Chicago; Institute of Tropical Medicine, Antwerp; Department of Zoology, Catholic University of Nijmegen, The Netherlands.

Genus *Radfordia* Ewing, 1938
Subgenus *Syconycterobia* Fain, 1973

This subgenus is characterized in the adults by the presence of a very long and strong dorsal seta on trochanter IV and the absence of any dorsal seta on trochanter III. The trochanters II-IV bear 3-2-3 setae respectively. Coxal setae 3-3-1-1 or 3-2-1-1. Genua II to IV with 7-6-5 setae. In the females the *sc i, sc e, l 1* and sometimes the *d 2* and *l 2* have a bifid apex.

In the tritonymphs the legs I are symmetrical, the legs II and III bear a single claw and the leg IV is devoid of claws. Most of dorsal setae are membraneous and transparent and the *d 2, d 3, l 2* and *l 3* are generally situated very close to each other and twisted.

Type species: *Radfordia (Syconycterobia) syconycteris* Fain, 1973.

Hosts: Native genera of Rodents of Australia *(Pseudomys, Notomys, Mastacomys, Conilurus, Zyzomys)* and also on *Melomys,* which is also represented in other regions of Australasia. The presence of the type species on a bat was probably accidental.

KEY TO THE SUBGENUS *SYCONYCTEROBIA*

- Females -

(N.B. The female of *R.(S.) mastacomys* is unknown)

1. Setae *v i* very thick and much longer (100μ) than the *v e* (60μ). The *sc i, sc e, l 1, l 2* and *d 2* very thick and subequal in width ..... *R.(S.) notomys* sp.nov.

   Setae *v i* thinner and either equal in length or shorter than the *v e* 2

2. The *sc e* distinctly longer than *sc i* 3

   The *sc e* shorter than the *sc i* 5

3. Setae *d 2* and *l 2* are 9μ thick and 135-140μ long; the *l 1* are 9μ thick and 165μ long; most of dorsal setae with their apex deeply divided. The *v i* as long as the *v e*. Body twice as long (426μ) as wide (210μ) ..... *R.(S.) zyzomys* sp. nov.

   Setae *d 2* and *l 2* distinctly thicker than *l 1;* dorsal setae much shorter and not deeply divided at apex. Body more elongate 4

4. Body 380-442μ long and 245-285μ wide (ratio 1,6:1). Setae ic 3 are 120μ apart, they are closer to the lateral border of the body than to the midline. Setae *sc e, sc i, l 1, d 2* and *l 2* are 99μ, 81μ, 105μ, 96μ and 96μ long respectively. The *d 2* and *l 2* are distinctly expanded in their posterior half ..... *R.(S.) latior* sp.nov.

   Body 330-336μ long and 183-186μ wide (ratio 1,8:1). Setae *ic 3* are 75μ apart, they are closer to the midline than to the lateral border of the body. Setae *sc e, sc i, l 1, d 2* and *l 2* are 78μ, 66μ, 76μ, 75μ and 75μ long respectively. The setae *d 2* and *l 2* are slightly thicker basally than apically ..... *R.(S.) vesca* sp.nov.

5. The *l 1, l 2* and *d 1* subequal in length and thickness ..... *R.(S.) pseudomys* Fain, 1976

   The *l 1* much thinner and shorter than *d 2* and *l 2* 6

6. Setae *v i* 52μ long and relatively thick; the *d 2* and *l 2* are 130μ and 115μ long respectively. The coxal IV much longer (18-20μ) than the *ic 4* (7μ). Leg setae short. Coxal setae 3-3-1-1 ..... *R.(S.) syconycteris* Fain, 1973

Setae *v i* 25-30μ long and narrow; the *d 2* and *l 2* are 100 and 110μ long respectively. The coxal IV as long as the *ic 4* (6μ). Most of the leg setae longer. Coxal setae 3-2-1-1 ..... *R.(S.) fanningi* Domrow, 1963

- Males -

(N.B.**1:** The males of *R.(S.) syconycteris, R.(S.) pseudomys* and *R.(S.) vesca* are unknown. We have not seen the male of *R.(S.) fanningi.*
2: For nomenclature of genital and dorsal setae see the paper of Fain and Lukoschus, 1977).

1. Setae *ic 4* thick and 48-51μ long; setae *d 1* very thick (7-8μ) and long (130μ) ..... *R.(S.) mastacomys* sp.nov.

Setae *ic 4* thin and not longer than 15μ; setae *d 1* much thinner and not longer than 60μ 2

2. Seta *d 2* is thicker and longer (85μ) than *d 1* (55μ) ..... *R.(S.) zyzomys* sp.nov.

Seta *d 2* is thinner and shorter than *d 1* 3

3. Setae *sc i* very thin, non-toothed and 12μ long; the *d 1* are about twice as long (42-48μ) as the *d 2* (22-24μ). Setae *ic 1* thin and short (10μ) ..... *R.(S.) notomys* sp.nov.

Setae *sc i* thicker, toothed and 21μ long; the *d 1* about 1,5 time longer (40-48μ) than *d 2* (29-36μ). Setae *ic 1* thick and 30μ long ..... *R.(S.) latior* sp.nov.

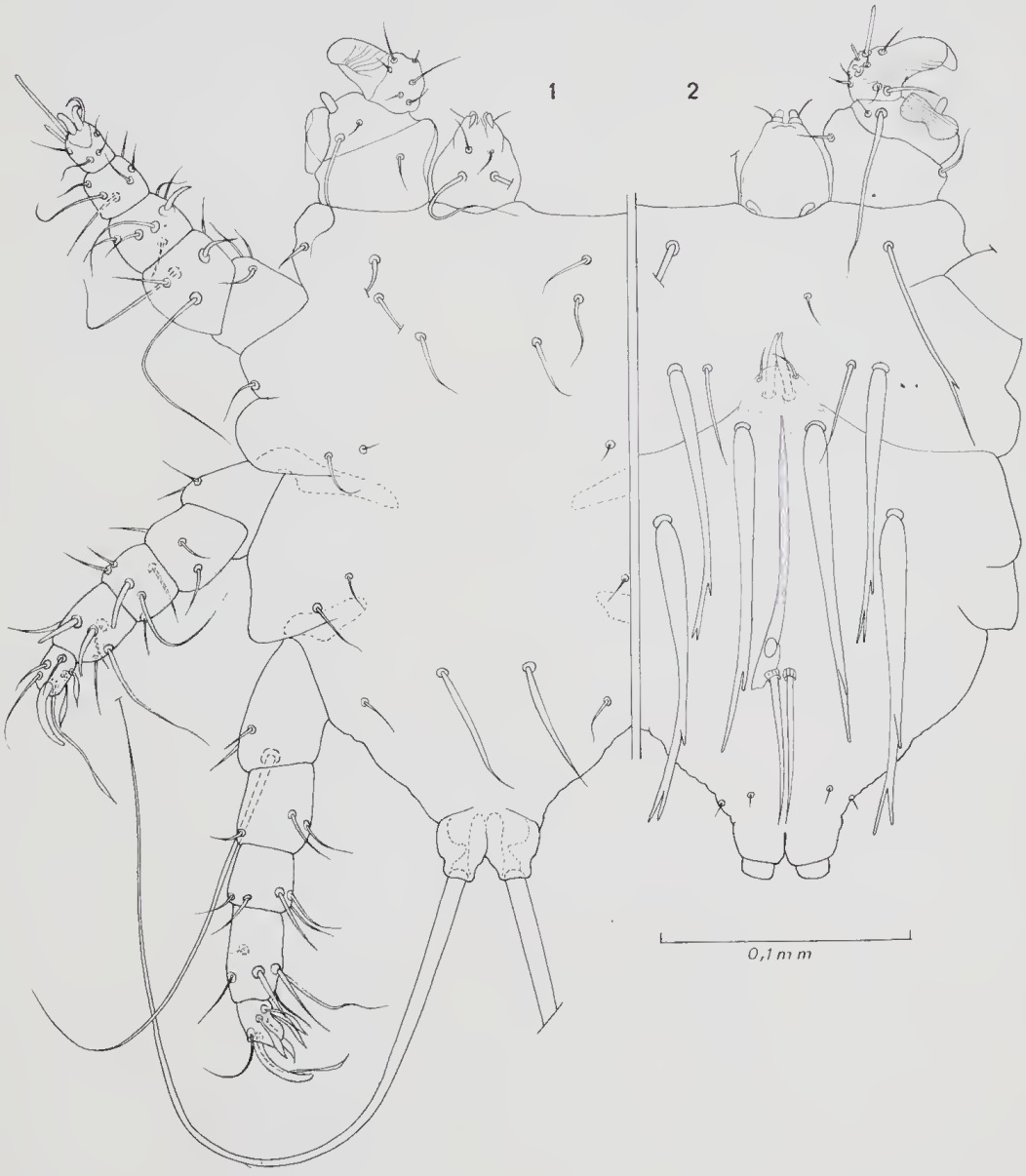
1. *Radfordia (Syconycterobia) mastacomys* sp.nov.

Male (Fig. 1-2): Holotype 302μ long and 194μ wide. **Dorsum:** genital aperture at 15μ behind the base of *sc e*. Penis 90-95μ long. The *sc i* are thin and 39μ long. The *d 1* are very thick (7-8μ) and very long (130μ); the *d 2* are 60μ long. Setae *l 1* very thick in their basal half (10-11μ) and with a bifid apex. **Venter:** coxal setae 3-2-1-1. The *ic 4* are thick and 48-51μ long (until 60μ in paratypes). The internal coxals III-IV are thicker and longer than the *ic 3* and *ic 4*. Legs relatively long. The genu II bears a cylindroconical recurved spine.

Female: unknown.

Host and locality

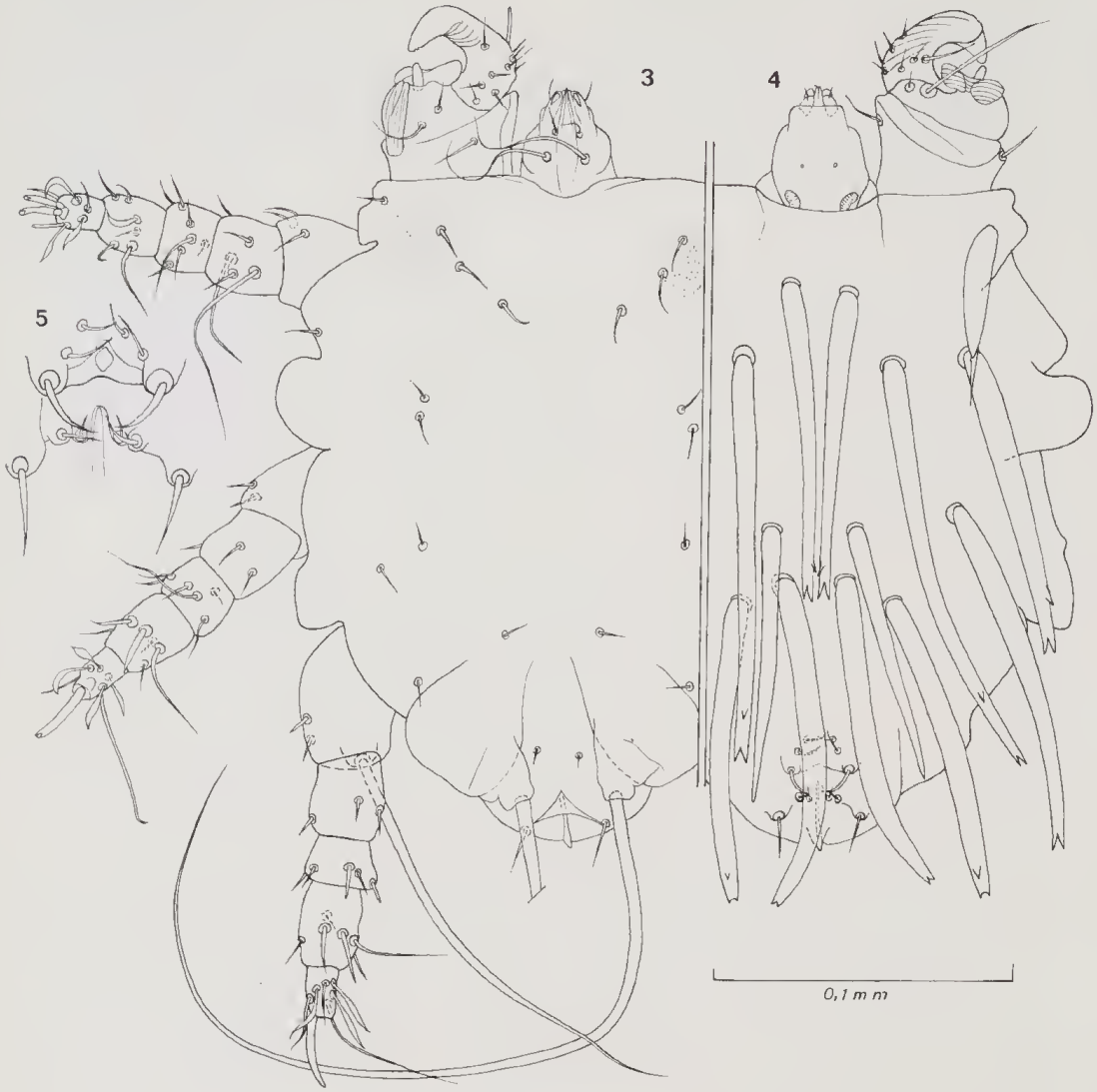
On *Mastacomys fuscus* Thomas, 1882, White's River, N.S.W., 11.II.1958 (rat n° M5285, in the collection of Western Australian Museum) (holotype and 6 paratypes male, 10 nymphs).



Figs 1-2: *Radfordia (Syconycterobia) mastacomys* sp.n. Holotype male. **Fig. 1** - ventrally; **Fig. 2** - dorsally.

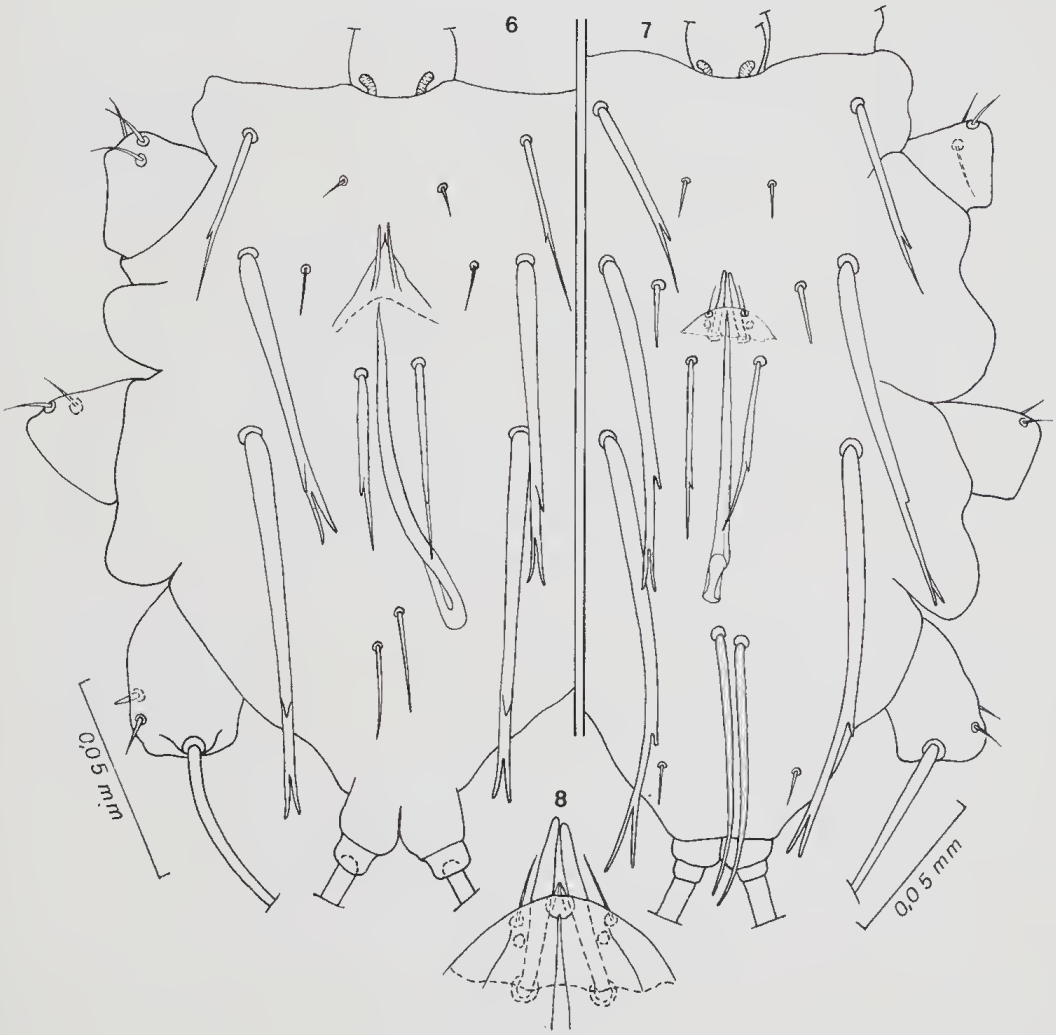
2. *Radfordia (Syconycterobia) notomys* sp.nov.

Female (Figs 3-5): Holotype 250μ long and 190μ wide. **Dorsum:** most of dorsal setae are cylindroconical, very thick and long: the *v i, sc i, sc e, l 1, d 1* and *d 2* are 105μ, 132μ, 108μ, 120μ, 90μ and 108μ long respectively; some have a bifid apex. Genital lobes unconspicuous, the *g 7* setae are thin. **Venter:** coxal setae: 3-2-1-1. The *ic 2* to *ic 4* are very small. Legs: leg IV distinctly longer than leg III; femora and genua II to IV with thin, not spinelike setae. Genua II-IV with 7-6-5 setae.



Figs 3-5: *Radfordia (Syconycterobia) notomys* sp.n. Holotype female. **Fig. 3** - ventrally; **Fig. 4** - dorsally; **Fig. 5** - genital area.

Male (Fig. 6): Allotype 219μ long and 146μ wide. **Dorsum:** genital aperture at 10μ behind the level of *sc e* setae. The *v i* and *sc i* setae are very thin, they are 5μ and 10μ long. The *d 1* are thicker and longer (42-48μ) than the *d 2* (22-24μ). (In the paratype from *Notomys alexis,* the *d 1* and *d 2* are 57μ and 42μ long respectively.) The *v e* are thin and 42μ long; the *sc e* and *l 1* are much thicker, their apex is bifid and they measure 80μ and 94μ long respectively. **Venter:** *ic 3* widely separated (87μ apart) and closer to the lateral margin of the body than to the midline. The *ic 1* is thin and short 10μ. Legs IV distinctly longer than leg III.



Figs 6-8: Fig. 6 - *Radfordia (Syconycterobia) notomys* sp.n. Allotype male dorsally. **Fig. 7,8** - *Radfordia (Syconcterobia) zyzomys* sp.n. Allotype male (**7**); genital area (**8**).

Tritonymph: a specimen containing a female is 318μ long and 240μ wide. Tarsus IV without claw but with 4 strong hairs amongst which 2 are bifid. Dorsal hairs very long and wide, they are membraneous and excessively transparent except for a central axis which is slightly sclerotized; the posterior setae are strongly curved.

Deutonymph: length 215μ, width 210μ. The leg IV is lacking. Dorsal setae as in tritonymph.

Host and locality

1. On *Notomys* sp., Kalbarri, Western Australia, 13.V.1965 (rat n° M6698, in the Western Australian Museum) (holotype and 12 paratypes female, allotype and 1 paratype male, 12 nymphs paratypes).
2. On *Notomys alexis* Thomas, 1922, Wanjarri Park, 8.I.1975 (rat n° M12964, in the Western Australian Museum) (4 females, I male and 10 nymphs, all paratypes). From the same host, in Miss Gibson Hill, 16.III.1975 (rat n° MI3330 in the W.A.M.) (1 female and 1 nymph, paratypes).

3. *Radfordia (Syconycterobia) zyzomys* sp.nov.

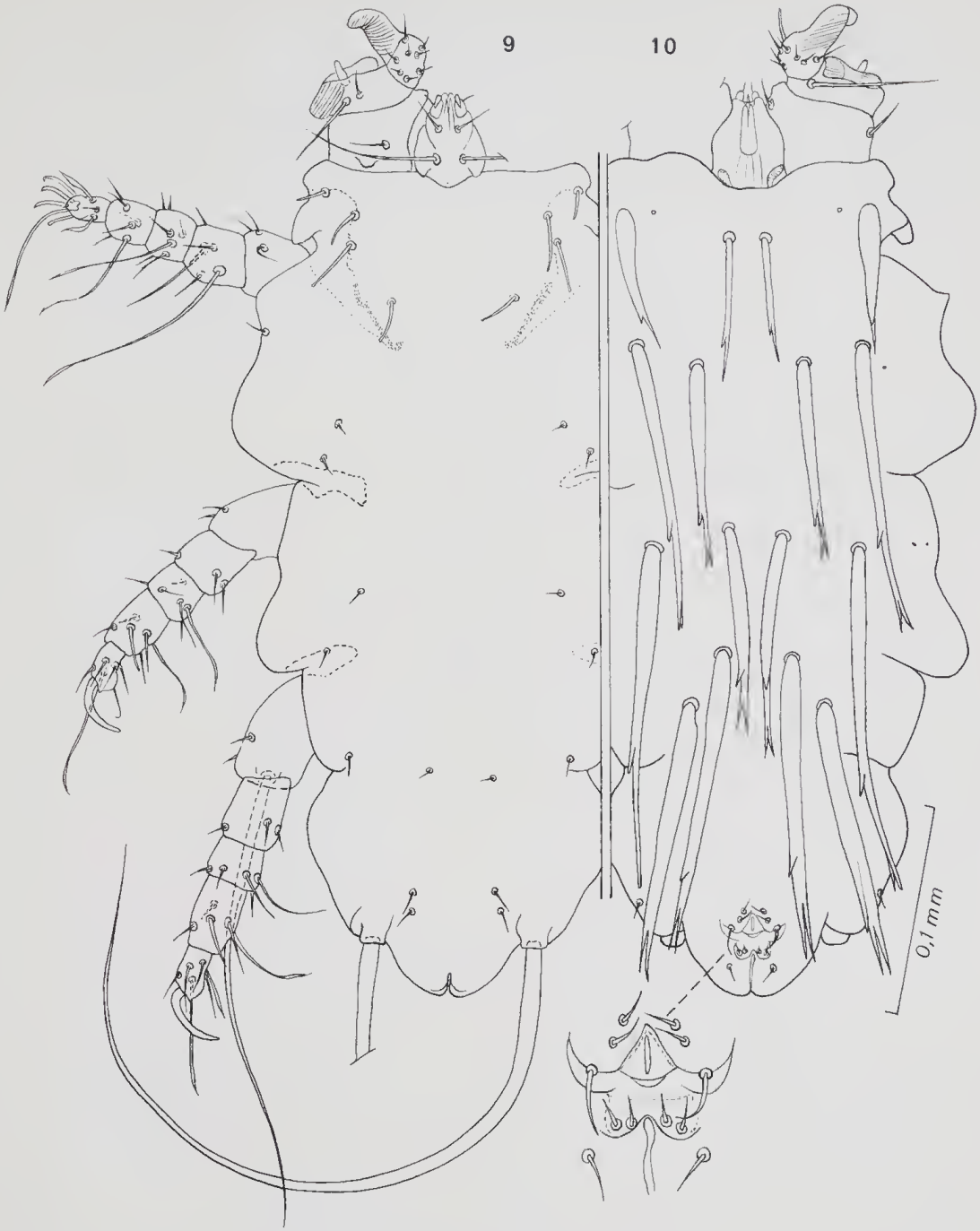
Female (Figs 9-10): Holotype 426μ long and 210μ wide. **Dorsum:** the *v i* are much narrower than the *v e* but approximately as long as the latter. Setae *sc e* much longer (135μ) than the *sc i* (96μ); these setae, as well as the *d 1, d 2, l 1* and *l 2*, are deeply incised at their apex. The setae *d 2, l 2* and *l 1* are equally thick (9μ). There are no distinct genital lobes. The *g 7* setae very thin. **Venter:** coxals II-IV and *ic 2* to *ic 4* very small, the coxals I and *ic 1* are stout rods of I8-25μ long. Gnathosoma bearing ventrally a pair of very long posterior setae. Legs IV distinctly longer than legs III and II.

Male (Figs 7-8): Allotype 291μ long and 165μ wide. **Dorsum:** genital aperture at 15μ behind the level of *sc e* setae. Penis straight, 90μ long. The *sc i* are thick rods, I8μ long. The *d 1* are thinner and shorter (55μ) than the *d 2* (85μ). The *v e, sc e* and *l 1* are 66μ, I14μ and 132μ long respectively. The *sc e* and *l 1* are deeply divided at their apex. **Venter:** legs and gnathosoma as in the female.

Tritonymph: resembling that of *R.(S.) notomys* but the tarsus IV bears 4 thick and not furcate setae.

Host and locality

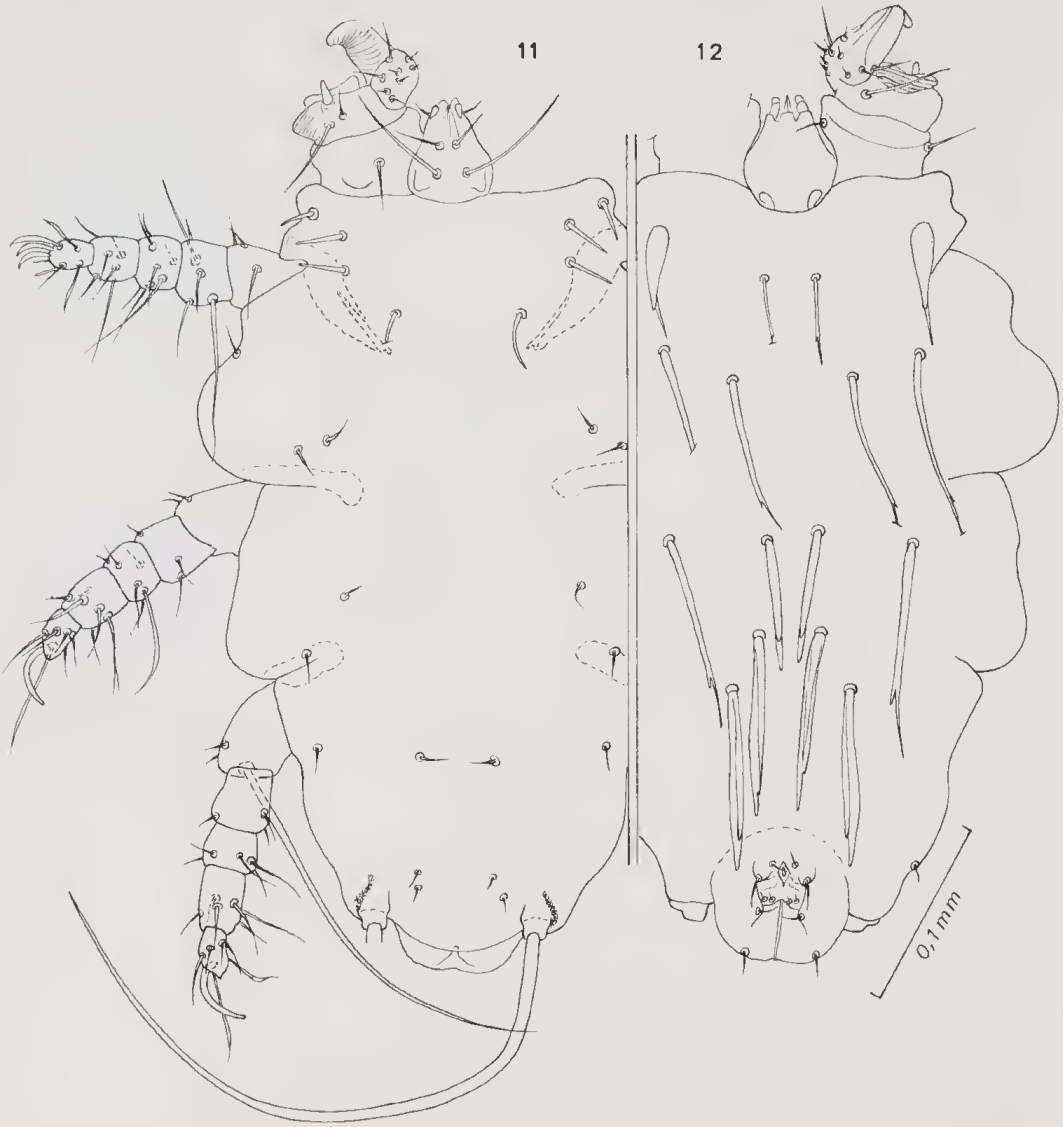
On *Zyzomys argurus* (Thomas, 1889), Napier Downs, Western Australia, 30.VIII to 2.IX.1976 (rats n° 2660, 2637 and 2638) (Holotype and 7 paratypes female, allotype and 3 paratypes male, 29 paratypes nymph); Brooking Springs, 29.IX. 2.X. and 28.XI.1976 (rats n° 2806, 2832 and 2883) (2 females, 1 male and 3 nymphs, paratypes); Beverley Springs, 22.XI.1976 (rat n° 2792) (I female, 5 males and I nymph, paratypes).



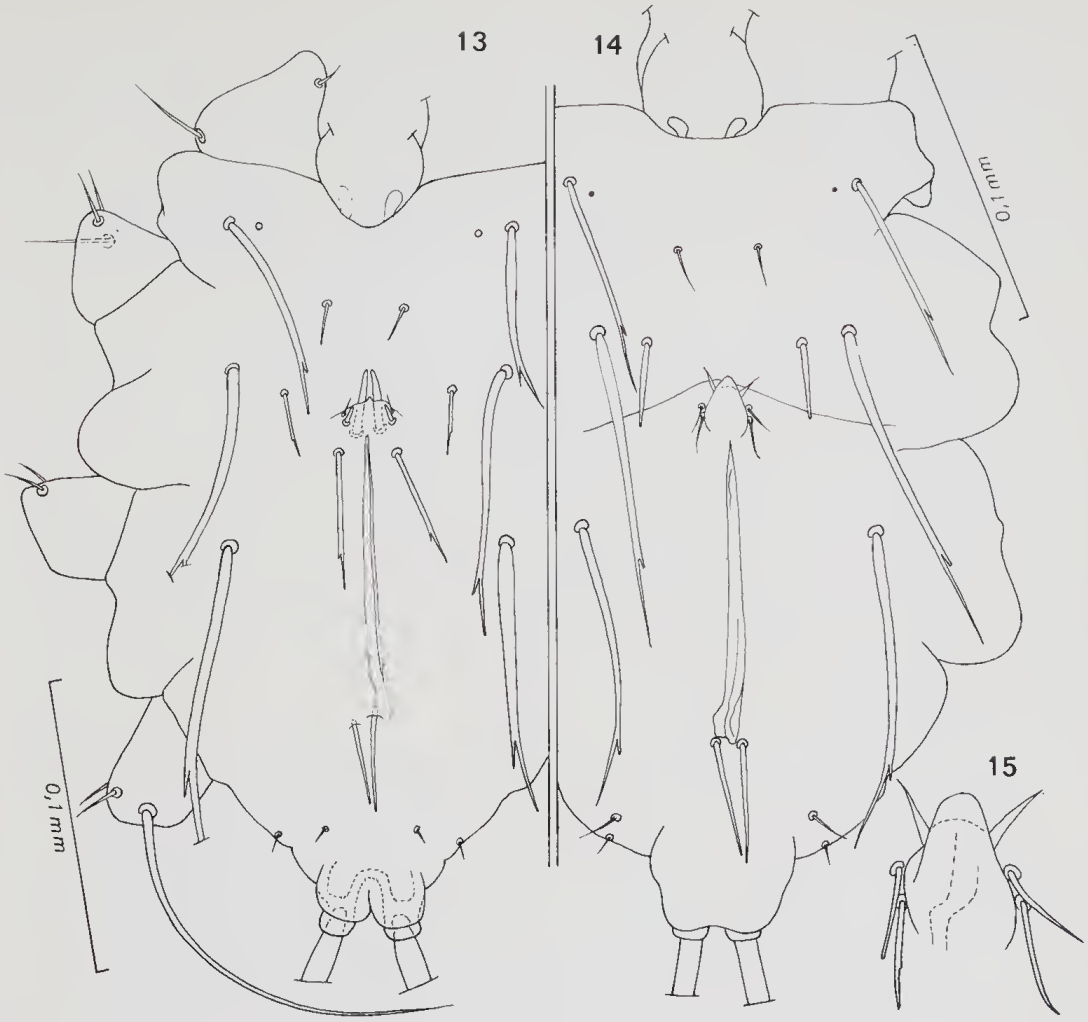
Figs 9-10: *Radfordia (Syconycterobia) zyzomys* sp.n. Holotype female. **Fig. 9** - ventrally; **Fig. 10** - dorsally.

4. *Radfordia (Syconycterobia) latior* sp.nov.

Female (Figs 11-12): Holotype 442μ long and 270μ wide. In 4 paratypes the length and the width are 429 x 255μ; 419 x 280μ; 390 x 250μ and 380 x 245μ respectively. **Dorsum:** the *v i* are narrow and toothed and 36-45μ long. The *v e* are inflated basally and also toothed, they are 63μ long. The *sc i* are shorter (81μ) than the *sc e* (96μ). The *d 2* and *l 2* are inflated in their apical half (8μ wide) and are much thicker but shorter (90μ) than the *l 1* (105μ). Genital lobes absent, the *g 7* setae are small.



Figs 11-12: *Radfordia (Syconycterobia) latior* sp.n. Holotype female. **Fig. 11** - ventrally; **Fig. 12** - dorsally.



Figs 13-15: Fig. 13 - *Radfordia (Syconycterobia) latior* sp.n. Allotype male dorsally. **Figs 14,15** - *Radfordia (Radfordia) australiana* sp.n. Allotype male dorsally (**14**); genital area (**15**).

Venter: the *ic 1* and the coxals I are much longer (22-30μ) and much thicker than the *ic 2 - ic 4* and the coxals II-IV. Coxal setae: 3-2-1-1. Distances *ic 3 - ic 3* = 120μ, *ic 4 -ic 4* = 36μ. The *g 1* and *g 2* are rodlike and short. Legs IV slightly longer than leg III. Tarsal part of fused first segment of legs I with a large foliate anterior seta.

Male (Fig. 13): Allotype 294μ long and 198μ wide. **Dorsum:** genital orifice at 20μ behind the level of *sc e*. Penis 80μ long. The *sc i* are 23μ long, they are cylindrical and toothed. The *d 1* are toothed and 45μ long, the *d 2* are not toothed and 36μ long. The *v e* are shorter (63-70μ) than the *sc e* (90μ). **Venter:** as in the female except that the *ic 4* are thicker and longer (15μ). Legs as in the female.

Host and locality

On *Conilurus penicillatus* (Gould, 1842), Port Warrender, Western Australia, 31.X.1976 (rat n° 1349) (holotype and 4 paratypes females, allotype and 3 paratypes males, 8 paratypes nymphs) and 29.X.1976 (rat n° 3110) (2 female paratypes).

We attribute provisionally to *R.(S.) latior* two specimens (1 female and 1 male) from the same host and locality (rat n° 3159), which differ from the typical series mainly by the smaller size of the body in the female (325 x 210μ).

5. *Radfordia (Syconycterobia) vesca* sp.nov.

Female (Figs 16-17): Holotype 369μ long and 210μ wide. **Dorsum:** setae *v e, v i, sc e, sc i, d 1, d 2, l 1* and l 2 are 66μ, 45μ, 78μ, 66μ, 57μ, 75μ, 76μ and 75μ. Absence of genital lobes, the *g 7* are small. **Venter:** coxal setae 3-2-1-1. Coxals I and *ic 1* thicker and longer than *ic 2 - ic 4* and coxals II-IV. The *ic 4* are longer and stronger than *cx IV* (6μ). Distances *ic 3 - ic 3* = 75μ, *ic 4 - ic 4* = 30μ. Legs IV distinctly longer and stronger than leg III. Leg setae relatively thin and long. Tarsus I with an anterior foliate seta. Trochanters I with a rounded ventral prolongation. Ventral surface of gnathosoma with two posterior pointed prolongations.

Male: unknown.

Host and locality

On *Pseudomys nanus* (Gould, 1859), Mitchell Plateau, 20.X.1976 (rat n° 3029) (holotype and 1 paratype females).

6. *Radfordia (Syconycterobia)* sp.

This species is represented only by two nymphs and a male in bad condition, with most of the setae lost or incomplete. Body of the male 255μ x 135μ.

Host: *Mesembriomys macrurus* Peters, 1876, Mitchell Plateau, 22.X.1976 (rat n° 3062).

Subgenus *Radfordia* Ewing, 1938

1. *Radfordia (Radfordia) affinis* (Poppe, 1896)

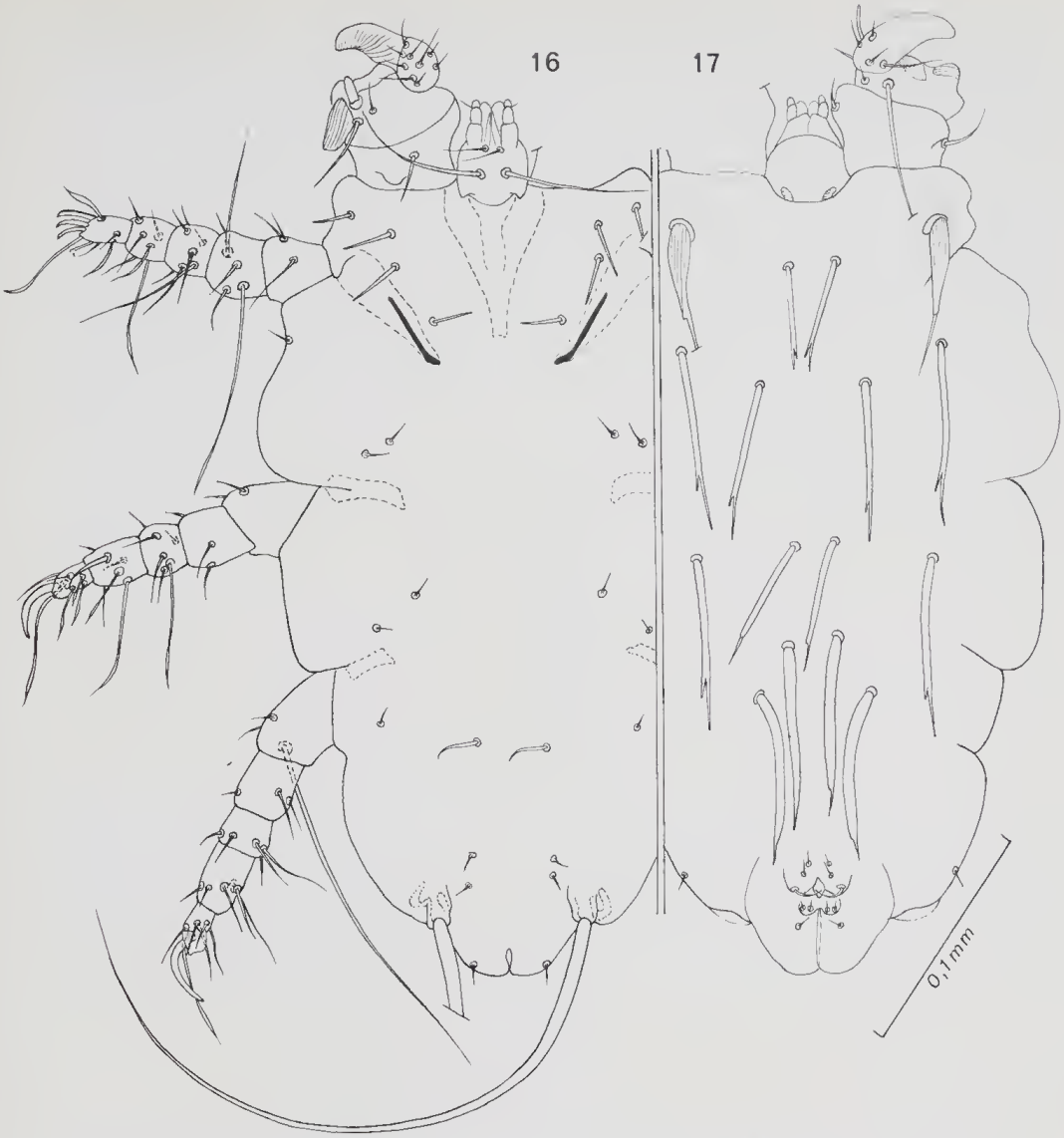
This species has been reported from *Mus musculus* in Australia by Domrow (1962).

We have found this species on the same host in Brooking Springs, 28.IX.1976 (host n° 2808) (1 male and 1 female).

2. *Radfordia (Radfordia) ensifera* (Poppe, 1896)

This cosmopolitan species has been reported from *Rattus norvegicus* and *R. rattus,* in Australia (Domrow, 1955).

We have found on *Rattus rattus,* from Beagle Bay, 28.III.1976, several female specimens belonging to this species.



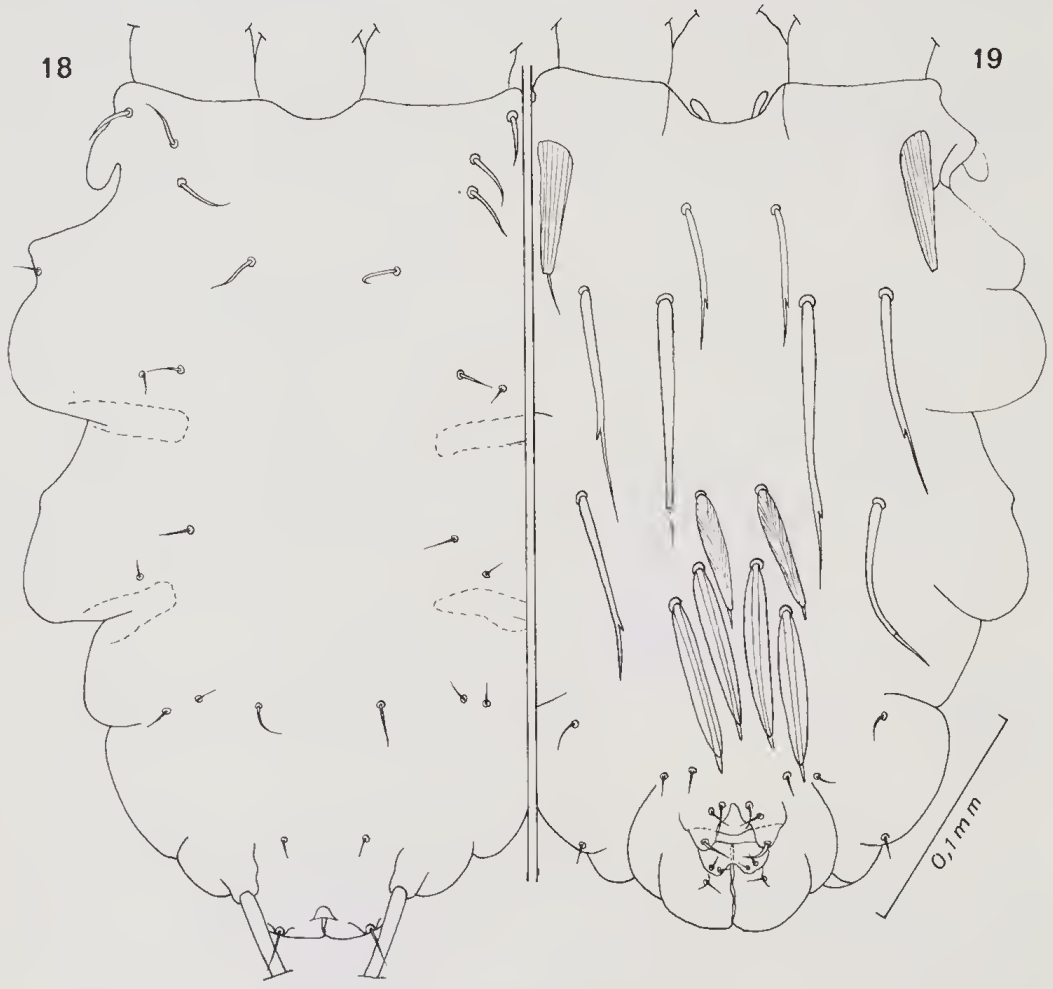
Figs 16-17: *Radfordia (Syconcterobia) vesca* sp.n. Holotype female. **Fig. 16** - ventrally; **Fig. 17** - dorsally.

3. *Radfordia (Radfordia) australiana* sp.nov.

This species is close to *R.(R.) ensifera,* however it is distinguished from it in the female by the greater length of the *l 1* setae (80μ, for 45μ in a specimen of *R. ensifera* from *Rattus norvegicus*), the smaller length of the *ic 4* setae (18μ, instead of 30μ in *ensifera*). In the tritonymph the setae *sc e, sc i, d 1, d 2, l 1, l 2, l 3* are membraneous and much wider and more asymmetrical than in *R. ensifera,* and the *v i* are longer (80μ, for 30μ in *ensifera*).

Female (Figs 18-19): Holotype 390μ long and 259μ wide. **Dorsum:** *v i* setae rodlike and toothed, 60μ long; *sc i* setae longer (120μ) than *sc e* (88μ); *l 1* setae 80μ long; *d 1* lanceolate-foliate 57μ long and 9μ wide; the *d 2* and *l 2* are 80μ and 75μ long and 10-11μ wide. Genital lobes poorly developed. **Venter:** coxal setae 3-2-1-2. The *ic 1* relatively thick and 21μ long, the *ic 4* narrower and 18μ long; the *ic 2* and *ic 3* much thinner and 12-15μ long. Legs II-IV with rather long setae and without true spines, except at the anteroventral seta of tibia II distinctly spinous.

Male (Figs 14-15): Allotype 310μ long and 198μ wide. **Dorsum:** genital orifice at 25-30μ behind the level of *sc e* setae. The *v i* are very thin, the *sc i* are thicker and 27μ long, both are toothless. Penis 90μ long. There are 3 pairs of thin setae in the genital area. The paramedian pair in the posterior region of the dorsum is 42μ long. **Venter:** as in the female.



Figs 18-19: *Radfordia (Radfordia) australiana* sp.n. Holotype female. **Fig. 18** - ventrally; **Fig. 19** - dorsally.

Tritonymph: Body 260μ long, 255μ wide. Legs I symmetrical. Tarsi II and III with one claw, tarsus IV without a claw but bearing 5 unequal setae: one strong bifid rod, one smaller spinous setae, one foliate, one very thin and one very small. **Dorsum:** the *sc i, sc e, d 1, d 2, l 1, l 2* and *l 3* setae are broad, membraneous and strongly asymmetrical. The *v e* are very small; the *v i*, situated between the *sc i*, are membraneous, 80μ long, narrow and only slightly asymmetrical.

Deutonymph: With only the legs I-II and III. Dorsal setae as in tritonymph but smaller.

Venter: the *ic 1* to *ic 4* are present.

Protonymph: As deutonymph but the *ic 4* are lacking.

Host and locality

On *Rattus tunneyi* Thomas, 1904, Mount Hart, 10.IX.1976, (rat n° 2681) (holotype and 7 paratypes females, allotype and 8 paratypes males; 25 paratypes nymphs).

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